Switching device based on wave function size change

Dear Sir,

Following required amendments to the claims.

Best Regards,

Inventor: Erez Yahalomi,(Tarpad 8, Ramat-Hasharon, Israel)

Erez Yahalomi

Application no 10/686,914
Confirmation no. 7454

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450
www.uspto.gov

Notice of Non-Compliant Amendment (37 CFR 1.121) 10/686,914

The amendment document filed on 7/26/05 is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121. In order for the amendment document to be compliant, correction of the following item(s) is required. Only the corrected section of the non-compliant amendment document must be resubmitted (in its entirety), e.g., the entire "Amendments to the claims" section of applicant's amendment document must be re-submitted. 37 CFR 1.121(h).

THE FOLLOWING CHECKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

☐ 1. Amendments to the specification:
- ☐ A. Amended paragraph(s) do not include markings.
- ☐ B. New paragraph(s) should not be underlined.
- ☐ C. Other: _____

☐ 2. Abstract:
- ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
- ☐ B. Other _____

☐ 3. Amendments to the drawings: _____

☒ 4. Amendments to the claims:
- ☐ A. A complete listing of all of the claims is not present.
- ☐ B. The listing of claims does not include the text of all pending claims (including withdrawn claims)
- ☒ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified. Note: the status of every claim must be indicated after its claim number by using one of the following 7 status identifiers: (Original), (Currently amended), (Canceled), (Withdrawn), (Previously presented), (New) and (Not entered).
- ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
- ☐ E. Other: _____

For further explanation of the amendment formas required by 37 CFR 1.121, see MPEP Sec. 714 and the USPTO website at http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/officeflyer.pdf.

If the non-compliant amendment is a **PRELIMINARY AMENDMENT**, applicant is given ONE MONTH from the mail date of this letter to supply the corrected section which complies with 37 CFR 1.121. Failure to comply with 37 CFR 1.121 will result in non-entry of the preliminary amendment and examination on the merits will commence without consideration of the proposed changes in the preliminary amendment(s). This notice is not an action under 35 U.S.C. 132, and this **ONE MONTH** time limit is **not extendable.**

If the non-compliant amendment is a reply to a **NON-FINAL OFFICE ACTION (including a submission for an RCE)**, and since the amendment appears to be a *bona fide* attempt to be a reply (37 CFR 1.135(c)), applicant is given a **TIME PERIOD** of **ONE MONTH** from the mailing of this notice within which to re-submit the corrected section which complies with 37 CFR 1.121 in order to avoid abandonment. **EXTENSIONS OF THIS TIME PERIOD ARE AVAILABLE UNDER 37 CFR 1.136(a).**

If the amendment is a reply to a **FINAL REJECTION**, this form may be an attachment to an Advisory Action. **The period for response to a final rejection continues to run from the date set in the final rejection**, and is not affected by the non-compliant status of the amendment.

TRACY YOUNG
Legal Instruments Examiner (LIE)

571 272 1644
Telephone No.

Rev. 6/04

CLAIMS

1. (Currently Amended) A ~~switching~~ device for switching between two states ~~such as 1 or 0~~ in computing or on off states ~~[[.]]~~. ~~Wwherein the switched state depends on the particle wave function size in space andwherein the wave function size depends on the particle total energy and the switching between the device two states is done by changing the particle total energy~~ compromising:
(a) said switch state determined by said particle electric charge distribution in space or particle occupancy distribution in space denoted as wave function size in space;
(b) said wave function size depends on the particle energy and the switching between said device two states is done by changing the particle energy.

2. (Original) The device of claim 1 wherein one states is indicated by a certain particle wave function size in space and other state is indicated by a bigger particle wave function size in space.

3. (Cancelled)

4. (Cancelled)

5. (Previously presented) A switching device as in claim 1 wherein the wave function size depends on the particle total energy. The switching between the device two states is done by changing the particle total energy.

6. (Currently Amended) The device of ~~A switching device as in~~ claim 1 wherein ~~the~~ said wave function size depends on ~~the~~ said particle kinetic energy and the ~~.The~~ switching between the device two states is done by changing the particle kinetic energy.

7. (Currently Amended) The device of ~~A switching device as in~~ claim 1 wherein the switching between the device two states is done by changing the particle potential energy. For example electric energy or magnetic energy.

8. (Currently Amended) The ~~A switching~~ device ~~as in~~ device of claim 1 ~~wherein representing the device switching statethe switching between the two states is achieved by transmitting energy to or from an additional particle and the particle represented~~
compromising:

(i) said particle switched between two states by energy receipt from additional particle to said particle.

(ii) said particle revert switched state by energy transmitted from said particle to other particle.

9. (Cancelled)

10. (Currently amended) The device of ~~A switching device as in~~ claim 1 ~~wherein the switching between the two states is achieved by photon or absorbs ion~~ absorption or emission ~~by the switched particle~~ compromising:

(i) said particle switched between two states by said particle photon absorption,

(ii) revert switching between said two state achieved by said particle photon emission.

11-12. (Cancelled)

13. (Original) The device of claim 1 wherein the switching between two states is achieved by phonon or phonons energy exchange with the switched particle.

14-15. (cancelled)

16. (Currently Amended) The device of ~~A switching device as in~~ claim 1 ~~comprising two boundaries in~~ on ~~two sides of the switching particle in the second state[[.]], Wwherein the two switching states is are detected by the corresponding values of the potential between the two boundaries.~~ comprising:

(i) a container contained particle wave function

(ii) two charged zones on two sides of said container wherein said switched particle wave function is detected by corresponded values of the potential between said two charged zones.

17-18. (Cancelled)

19. (Currently Amended) The [[A]] switching device ~~as in~~ of claim 1[[.]] ~~W~~wherein ~~the two switching~~ said two switched particle states ~~is~~ are detected by photon detection, photon scattering, photon absorption or photon transmission.

20. (Canceled).

21. (Currently Amended) The device of ~~A switching device for switching between two states such as 1 or 0 in computing or on off states. Wherein the switched state depends on the particle wave function dynamic size change in space .W according to~~ claim 1 ~~wherein the determination of the dynamics change in state includes detection of a current induced by dynamic chanege of expansion of said wave function of at least one particle. is detected by a corresponding to a charge current.~~
compromising :

(i) said container of said particle wave function.

(ii) said conductive element abutting said container wherein continues change of said particle wave function caused conduction on said conductive element.

22. (Currently amended) A switching device for switching between two states comprising:

(a) a two regions container.

(b) inside said container a particle is switched between two states wherein in one state the particle is in one region and in said second state said particle is on said second region wherein in near second region there is at least one element for detecting voltage or current change due to the present of the particle in second region. Wherein in this claim the particle movement is translation movement of the all the particle and not wave function expansion as in the previous claims.

(c) The particle state can be revert due to particle bounding to initial sate or due to reverting energy.

23. (currently amended) A switching device of claim 1 comprising:

(a) an electric current element.

(b) screening element close to the charge current element wherein said screening element has a limited region where electric charge in this region influenced said current element .

(c) a particle in a container that has two states, first state said particle wave function size adjusted only to said screening element . In second state said particle wave function expended to said limited region as well thereby influencing the current value in said electric current element.

(d) said switching between the two particle states is done by any of the method in claims 1, 5-8, 10, 13.

24-27. (Cancelled)

28. ~~{Formerly claim 23a}~~ (Currently amended) A switching device as in claim 1[[.]]

a. ~~comprizing~~ comprising ~~two~~ one regions or more which create a repulsive or attracted potential on a particle ~~between them~~[[.]] wherein ~~T~~the particle size is ~~depends~~ dependent on the repulsive or attracted potential value, such that by reducing the repulsive potential value or increasing attracted potential value the particle wave function size expands, thus achieving two states denoted by the particle wave function sizes[[.]] and ~~T~~to revert to the initial state the ~~repulsive~~ potential is reverted to its initial value.

(b) said switching device of section a wherein the electric potential on said charged regions could be a combination of repelled potential region and attracted potential region.

29. {Formerly claim 23b} (Cancelled)

30 (Currently amended). The device of ~~(New) A switching device as in~~ claim 1 wherein the change in said states is detected by a corresponding change in voltage of an electrode.

31.(Currently amended) - ~~A device comprising:~~

~~a container in which at least one particle is contained, wherein the particle in a first lower energy state is confined to a given region and wherein, in a second higher energy state, the particle is increased in size such that a portion of the at least one particle is outside the given region, while remaining in the container; and at least one electrode adapted to detect the presence of the portion of the at least one particle outside the region or of the transition of the at least one particle from the first to the second state.~~

The device of claim 1 compromising :

(i)a first region contained the particle wave function in the first switched state.

(ii) a second region adjacent to said first region contained expended part of said particle wave function of second switched state wherein said second region could be made of different material or structure as well.

32-36 (Cancelled)

37. (original) (New) A method of switching comprising:
providing at least one particle having a wave function bound to a region;
switching at least one particle from a first lower energy state in which the wave function of said particle has a first small extent to a second higher energy state in which the wave function of the at least one particle has a second larger extent, while remaining bound to the region; and
determining the state of the at least one particle or the transition of the at least one particle from one of said states to the other.

38. (Currently amended) ~~(New)~~ A ~~method~~ device according to claims 1,31,37 wherein ~~the determination of the state includes detection of a voltage induced by the expansion of the wave function of the~~ at least one ~~particle.~~ electric charge element such as electrode is positioned such that a detectable voltage change is induced on an electrode when said switch state changes.

39. (Currently amended) ~~(New)~~ A ~~method~~ device according to claims 1,31,37 wherein ~~the determination of the state includes detection of a current induced by expansion of the wave function of the~~ at least one ~~particle.~~ electric charge element such as electrode is positioned such that a detectable current change exists in said electrode when the energy state changes.

40. (Canceled)

41. (Original) (New) A method according to claim 37 wherein said switching is effected by an energy exchange with another particle or a phonon or by absorption or emission of a photon.

42. (New) The switching device of claim 31 comprising:

(i) said silicon layer with phosphorus dopants.

(ii) said undoped silicon layer

(iii) said silicon oxide insulator layer on two sides of said doped silicon layer.

(iv) said Aluminum based metallic contact on said insulator layer.

(v) said additional silicon oxide insulator layer.

(vi) said Aluminum current conductor on said additional silicon oxide insulator layer.

43. (New) The device of claim 1 compromising.

(i) an n- Type silicon wafer.

(ii) a thin insulator layer on said wafer.

(iii) a gate on insulator layer.

(iv) source and drain layers on said wafer at opposite sides of said gate.

(v) two insulator layers on gate.

(vi) metal contacts on said gate insulator layers and on said source and drain.

44. (New) The device of claim 43 wherein:

(i) said silicon wafer dopants are phosphorus atoms.

(ii) said insulator layers is made of silicon oxide

(iii) said gate is made of phosphorus dopants.

(iv) said source and drain dopants are boron atoms.

(v) said metal contacts are made of Aluminum.

45. (New) A gate compromising:

(i) semiconductor layer with dopants or insulator layer.

(ii) insulator regions on layer (a) .

(iii) charged region on one region or more on said insulator region thereby caused polarization inside the gate thereby gaiting is achieved.

46. (New) The device of claim 1 compromising:

(i) an n- Type silicon wafer.

(ii) a thin insulator layer on said wafer.

(iii) a gate on insulator layer.

(iv) two insulator layers on gate.

(v) two charged regions adjacent to said gate insulators that create an electric repulsive potential on particles wave functions inside the gate, determined said wave function size and switched state .

(vi) source and drain layers on said wafer at opposite sides of said gate.

(vii) metal contacts on said source and drain.

47. (New) The device of claim 45 wherein:

(i) said silicon wafer dopants are phosphorus atoms.

(ii) said insulator layers are made of silicon oxide

(iii) said gate is made of phosphorus dopants.

(iv) said source and drain dopants are boron atoms.

(v) said metal contacts are made of Aluminum.

48.. (Currently amended) {Formerly claim 24} A switching device as in claim 1- ~~23~~ 46 wherein the term particle refers to one or more than one electrons neutrons or protons, photons, atoms, or molecules. ~~That have a referred function as the referred particle in claim 1-23.~~ That have a referred function as the referred particle in claim 1-46.